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# Toward a Theory of Managing Creativity-intensive Processes: A Creative Industries Study

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## Abstract

This paper reports the results of an exploratory, theory-building study on the impact of creativity on business processes, their management, and the use of information technology (IT) in particular. The empirical evidence was derived from organizations within the creative industries, specifically film and visual effects (VFX) production. An adapted grounded theory approach was employed in order to analyze the data. The study identifies the dynamics of business processes that can be described as highly dependent on creativity, intensively involving the client, complex, and interdependent. It explains the processes' organizational context as well as strategies and IT systems that organizations use in order to manage these processes. The study suggests that creativity-intensive processes are characterized by high levels of uncertainty with regard to outcome, process structure, and required resources. Creative organizations pursue both creative and operational process performance while simultaneously mitigating creative and operational risk.

*Keywords: Business process management, creative industries, grounded theory, creativity*

## 1 Introduction

Creativity is commonly associated with the generation of products, services, processes, or ideas that are both novel and appropriate (Woodman et al., 1993; Amabile, 1996). Amabile (1998) states that, despite its indisputable importance to many organizations, “creativity is undermined unintentionally every day in work environments that were established – for entirely good reasons – to maximize business imperatives such as coordination, productivity, and control” (p. 77). As a consequence, managers are forced to ask questions such as *How can I successfully manage an organization without crushing creativity?*

One widely accepted approach that may provide a response to this question is that of business process management (BPM). As an emerging area in the information systems (IS) discipline, BPM focuses on analyzing and improving business processes in order to enhance organizational performance and sustain competitive advantage (Hung, 2006; Davenport, 1993). With the emergence of the creative industries (Hartley, 2005; Hesmondhalgh, 2002), as an entire sector that has developed around creative products, the management of business processes that involve creativity becomes

critical. Prominent examples include the production of computer games, visual effects (VFX), or feature films. At the same time, other industries such as software development, pharmaceuticals, or research and development increasingly are recognizing the role of creativity (Florida, 2002).

In recent years, research on BPM has shifted the focus towards so-called human-centric or knowledge work processes (Davenport, 2005; Eppler et al., 1999; Harmon, 2007). This has resulted in the increased recognition of knowledge, judgment, collaboration, and individual capabilities in many critical processes, ranging from financial operations to healthcare, art, design, and entertainment. Davenport (2005) claims that in the United States alone 28% of the workforce, or 36 million people, are so-called knowledge workers, whose jobs are concerned with the creation, distribution, and application of knowledge. Although such studies reveal important factors such as high levels of required autonomy, motivation, and expertise, the role of creativity and its consequences for the management of these processes has not been investigated in depth. Yet, this knowledge is particularly critical to organizations in industries that not only benefit from, but rely on creativity.

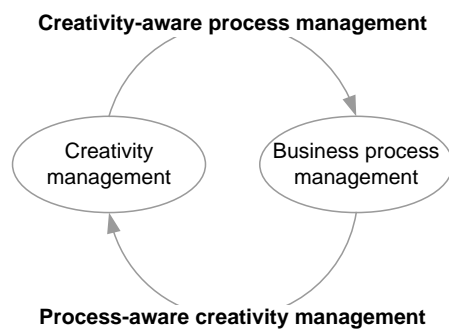
Research on organizational creativity, on the contrary, has traditionally focused on individuals, groups, and organizations as the level of analysis (Drazin et al., 1999). Existent theories explain, at different levels, the occurrence of creativity, creative behavior, and creative products (e.g., Williams & Yang, 1999; Guilford, 1967; Rubenson & Runco, 1992; Ekvall & Ryhammer, 1999; Runco, 2007; Amabile, 1990). Multilevel theories, such as the one proposed by Woodman et al. (1993), suggest that creativity at a higher level is a function of creativity at the lower levels. Research questions typically focus on how the creative outcome of an organization can be enhanced. As a consequence, Drazin et al. (1999) identify that “scholars tend to model creativity as a discrete task, conducted by individuals or small groups who are isolated from broader organizational and occupational pressures” (p. 289). They also state that viewing creativity as an outcome rather than a process has led towards static models with the purpose of explaining variance of the creative outcome (exemptions can be found in Drazin et al., 1999; Ford, 1996; Borghini, 2005; Mace & Ward, 2002). The recognition of the importance of a process-oriented view as opposed to an outcome-oriented perspective is comparable to the emergence of total quality management (TQM), which proposed to focus on the process quality as the ultimate cause for the end product’s quality (e.g., Powell, 1995).

Existent models of creativity in organizations, due to their level of analysis, the perception of creativity as a discrete task, a mere focus on the creative output, and their static nature, are less applicable to explain how creativity influences business processes and their management. For example, while explaining various factors that impact the outcome of organizational creative processes (e.g., Woodman et al., 1993), these theories do not sufficiently capture the processes’ dynamics including required process steps, potential iterations, as well as strategies and information technology (IT) that organizations use throughout the process. Moreover, it cannot be assumed that the creative outcome, or organizational creativity (Woodman et al., 1993), is the only consequence that organizations intend when they accomplish business processes that contain creativity. Models of the creative process (e.g. Wallas, 1926; Osborn, 1957; Ghiselin, 1963), on the contrary, predomi-

nantly focus on individuals and small groups (Lubart, 2001) and thus fall short in considering the complexities of organizational environments.

With regard to how creativity can effectively be managed, different managerial practices and models are discussed in the literature (e.g., Amabile, 1998; Styhre & Sundgren, 2005; Tan, 1998; Perry, 1995; Davis & Scase, 2000). Amabile (1998), for example, proposes challenge, freedom, resources, work-group features, supervisory encouragement, and organizational support as means to foster creativity. Styhre and Sundgren (2005) discuss practices that are related to technology, intuition, and leadership. Tan (1998) proposes a total systems approach to managing creativity in organizations and identifies three major types of interventions, namely with regard to culture, organization and design, and training development. While these studies explain how creativity in organizations can be nourished, they do not sufficiently relate the proposed practices to the underlying business processes.

Consequently, in the present study it is argued that existent literature does not provide ample answers to the question of how creativity influences business processes and how these processes can be managed. This has resulted in a gap between research on creativity and creativity management on the one hand, and research on BPM on the other hand. Figure 1 suggests that the recognition of the importance and impact of creativity on BPM may be framed as *creativity-aware process management*. The recognition of BPM as a management approach with the potential of effectively managing organizational creative processes may then be framed as *process-aware creativity management*.



**Figure 1:** Creativity-aware process management vs. process-aware creativity-management

As the present study seeks answers to the question of how creativity impacts business processes, and the management of these, it predominantly focuses on what has been framed as creativity-aware process management in Figure 1. In doing so, it is expected that the study

- (a) advances the recent discussion on human-centric and knowledge-intensive processes by particularly recognizing the phenomenon of creativity as a vital facet of human action and behavior that is increasingly considered as being imperative to organizational success and
- (b) adds a new relevant level of analysis to the phenomenon of organizational creativity, as business processes are a cross-functional and even cross-organizational concept involving individuals, groups, IT, and other resources.

It is assumed that the understanding of the phenomenon of creativity at a process level is imperative to the development and adaptation of IT artifacts, as well as for process re-design, so as to

ultimately enhance organizational effectiveness. Moreover, with the emergence of concepts such as case handling or ad-hoc workflow (v.d.Aalst et al., 2005) along with technologies such as service-oriented architectures (Erl, 2004) allowing for more flexible and adaptive work environments, the discussion of creativity within business processes is further nurtured.

In the present study a theory was developed inductively based on qualitative data collected in multiple case studies (Eisenhardt, 1989). The creative industries provide an “extreme situation” in which the “processes of interest are transparently observable” (Eisenhardt, 1989, p. 537). The case study organizations belong to the domains of film and VFX production, which are part of the creative industries. The phenomena to be studied were processes that can be described as highly dependent on creativity, intensively involving the client, complex, and interdependent. The resulting emergent theory is, in the first instance, limited to explaining phenomena in the substantive area that was studied (Glaser & Strauss, 1967; Strauss & Corbin, 1998). However, by engaging with existent theory, the specific theory is integrated with insights from the related literature and thus a more general theoretical framework is developed.

The inductive design is advanced based on the awareness that, even though existent theories explain various factors and their interplay from various perspectives, little is known about how organizations effectively deal with the phenomenon of creativity at a process level. With regard to what has been framed as creativity-aware process management, it is legitimate to posit that no applicable theory exists. Data was analyzed using an adapted grounded theory approach based on the work of Strauss and Corbin (1998). This approach was particularly fitting, as subject to this study were processes in a new topic area where no applicable theory was available (Glaser & Strauss, 1967; Strauss & Corbin, 1998; Orlikowski, 1993).

The remainder of this paper is structured as follows. The next section briefly introduces the research questions. This is followed by a description of the research methodology, before the findings are presented in the two subsequent sections. In a section on engaging with existent theory, the findings are compared and contrasted to the related literature. The paper closes with a summary, a discussion of limitations, and an outlook to future research.

## 2 Research Questions

This paper aims to investigate how processes that rely on creativity can be managed. Correspondingly,

*How does creativity influence business processes and the management of these?*

This rather broad research problem could be further broken down into a set of more specific research questions which evolved during the course of this study (Urquhart, 2001). Correspondingly,

*(RQ1) What characterizes business processes in film and VFX production and what are the contextual factors that organizations in this industry need to consider when managing these processes?*

*(RQ2) What particular strategies do organizations use to manage business processes that rely on creativity?*

*(RQ3) How are these strategies combined, and how are they supported by IT?*

(RQ4) *What are the intended consequences of applying a set of strategies in order to manage creativity in business processes? What are the unintended consequences?*

The intention is to provide answers to the above questions by developing an integrated theoretical scheme; i.e., a substantive theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998) which is grounded in empirical data collected in interpretive case studies with organizations from film and VFX production.

### 3 Research Methodology

This research is interpretive in nature; the underlying assumption is that any access to reality is a social construction (Walsham, 1995; Klein & Myers, 1999; Orlikowski & Baroudi, 1991). The present study is exploratory and aims to generate theory as opposed to testing it. In order to inductively develop theory, interpretive case studies (Klein & Myers, 1999; Benbasat et al., 1987; Neuman, 1997; Walsham, 1995) were used since this research covers a new topic area and an intimate connection with empirical data is sought (Eisenhardt, 1989; Yin, 2003). In order to analyze data and build theory, the grounded theory method as proposed by Strauss and Corbin (1998) was used.

#### 3.1 Site Selection

With the purpose of identifying a natural setting to study processes in creative environments, three case study organizations from the creative industries were carefully chosen. These organizations are very much characterized by the creativity within their processes. Thus, organizations were selected where the phenomenon of interest could be easily observed (Eisenhardt, 1989). At the same time it was desired to enclose cases which are “likely to replicate or extend the emergent theory” (Eisenhardt, 1989, p. 537). In order to develop theory in a substantive area a primarily literal approach to selecting cases was chosen (Yin, 2003). Literal replication refers to sites where similar results are predicted, whereas theoretical replication refers to sites where contradicting results are predicted. Table 1 provides an overview of the case organizations.

**Table 1:** Case study organizations

Organization	Approx. number of employees	Main areas
<i>Organization A</i>	40	Teaching
<i>Organization B</i>	120	VFX production
<i>Organization C</i>	150	Post production, VFX production, TV commercials

The organizations that were investigated belong to the film and VFX production and are all located in Australia. Including three organizations from one sector with different focuses made it possible to investigate those organizations both in terms of their similarities and differences (Orlikowski, 1993).

*Organization A* is mainly a teaching body in the field of film, radio, and television production. The organization conducts smaller film production projects and therefore has good process knowledge of the different stages of film production.

*Organization B* is a production company for VFX that works on major studio productions, including Hollywood films. VFX are computer generated artifacts that are combined with conventional film material within television commercials, feature films, and other screen products. Processes in the VFX industry are characterized by the involvement of various creative people (VFX artists, technical directors, producers, etc.) who work on highly creative outputs.

*Organization C* focuses on post-production, which refers to the stage of film production in which footage and audio are joined to a coherent piece (Kellison, 2006). Besides classical post-production, Organization C also works in the areas of animation films and VFX production.

### 3.2 Data Gathering

Data collection took place over a period of approximately two years between 2006 and 2008, during which time more than 30 people were interviewed. Main data sources were semi-structured interviews, process analysis, and document analysis. The study started with informal interviews with managers, creative workers, and teaching professionals that involved approximately 15 respondents. The research problem became apparent and some initial tentative research questions were formulated. Semi-structured interviews were then conducted. The interviews were either audio-taped and then transcribed, or detailed notes were taken. During this phase of analysis the research questions were refined. Process-modeling techniques (Scheer et al., 2005; Davis, 2001) as well as document analysis (mainly existent process documentation) were used, so as to acquire an advanced understanding of the processes being studied, particularly the interaction between different involved actors and IT systems (for a similar approach of using process documentation in order to develop a comprehensive understanding of the subject area, compare Xu & Ramesh, 2007). A total of 24 people were involved in semi-structured interviews and process modeling, including both senior management (e.g., Chief Executive Officer) and artists (e.g., editors, digital effects supervisors), whereby 2 of these 24 people belonged to two additional sites that were included in order to theoretically sample. These two respondents were interviewed with a particular focus on the role of IT in the investigated processes. Table 2 provides an overview of interviewees who were involved in semi-structured interviews and process modeling.

**Table 2:** Interviewees in semi-structured interviews and process modeling

Organization	Number of interviewees	Roles
<i>Organization A</i>	6	Head of screen business department, producer, editors (2), production-executive, sound designer
<i>Organization B</i>	6	Chief Executive Officer, digital effects supervisors (2), VFX artists (3)
<i>Organization C</i>	10	General Manager, creative director, design coordinator, project manager, VFX artist, head of technical engineering, technical directors (3), facility manager
<i>Additional interviews</i>	2	Production manager, IT professional in the media industry

The approach of using multiple data collection techniques is referred to as triangulation across methods. Triangulation across methods is particularly useful when generating theory, as multiple perspectives allow the researcher to achieve a strong substantiation of emerging concepts (Orlikowski, 1993; Eisenhardt, 1989; Pettigrew, 1990; Glaser & Strauss, 1967). With regard to

grounded theory, Glaser and Strauss (1967) encourage researchers to include different data collection techniques as different types of data “give the analyst different views or vantage points from which to understand a category and to develop its properties” (p. 65). They call these different views “slices of data” and go as far as to say that in theoretical sampling “there are no limits to the techniques of data collection, the way they are used, or the types of data acquired” (Glaser & Strauss, 1967, p. 65). Fernandez et al. (2007) pick up this discussion and conclude that “the nature of the data is not important in itself”; more important is “the role the data play in providing evidence for useful conceptualizations” (p. 233).

### 3.3 Data Analysis and Theory Building

The software tool *NVivo* was used in order to support the process of data analysis and theory building. The process of theory-building following grounded theory is highly iterative as theory and data are constantly compared (Glaser & Strauss, 1967; Strauss & Corbin, 1998). This process can be referred to as *comparative analysis*. Glaser and Strauss (1967) further introduce the term *theoretical sampling* as a process of “data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges” (p. 45). They suggest combining a method of comparative analysis (constant comparison) with theoretical sampling.

In the present study the approach as proposed by Strauss and Corbin (1998) was used. In this approach three main stages of analysis can be distinguished: open coding, axial coding, and selective coding. The analysis starts with open-coding (Strauss & Corbin, 1998). During this process relevant categories are identified and evidence for these categories is collected. Categories are concepts that represent phenomena. For example, the role of the *artist* was identified as a category within the present study. Different aspects of a category are coded by using so-called properties. For example, *process expertise* was identified as a property of artists (artists “have” process expertise). This makes it possible to classify particular artists (objects) on a continuum of expertise from “low” to “high.” Emergent concepts were validated by their presence in several data sources; no attempt was made to statistically evaluate the strength of a concept (Strauss & Corbin, 1990, Xu & Ramesh 2007). In axial-coding (Strauss & Corbin, 1998), relationships between categories are identified. To do so, categories are classified by whether they represent (a) phenomena, (b) contextual factors, (c) strategies, or (d) consequences. The conditional structure is identified and structure thus is linked with process (Strauss & Corbin, 1998). Axial coding is followed by selective coding, where the core category (the central phenomenon of the study) is identified and other concepts are related to the central phenomenon in order to form an integrated theoretical scheme. The central phenomenon of this study is that of the creativity-intensive process. Contextual factors and consequences pertain to this central phenomenon and its parts.

The process of data analysis was highly iterative. The iteration between data and categories/relationships was concluded when additional data analysis did not provide any further insight and did not reveal further categories shaping the phenomenon under investigation. Glaser and Strauss (1967) refer to this stage in the process of data analysis as *theoretical saturation*.



Once selective coding was commenced, the resulting model (including propositions and textual descriptions) was shown to respondents and discussed further. The respondents' comments were systematically recorded and incorporated into the integrated theoretical scheme. As a result, the theoretical model that is introduced in this paper is (a) grounded in the data, was (b) constantly compared to incoming data, and (c) verified by the respondents.

Two analysts were involved in the process of coding. However, only one analyst conducted the entire coding phase. The second analyst did some rather 'high-level coding' of some selected data which served as a basis to discuss the plausibility of codes.

### **3.4 The Role of Existent Literature within this Research**

With regard to inductively building theory, Eisenhardt (1989) states that researchers should avoid thinking about the specific relationships between variables as this may bias and limit their potential findings. Yet she expresses that it is impossible to achieve the "ideal of a clean theoretical slate" (p. 536). Other authors have also pointed out that the idea of the researcher as a "blank slate" (Urquhart & Fernández, 2006) is a misconception. Strauss and Corbin (1998) further note that researchers "might turn to the literature or experience to find examples of similar phenomena" (p. 44). They should, however, avoid early thinking about the actual relationships between these variables. Also the researcher should be self-reflective in order to be conscious of biases that may result from their own background knowledge (Sarker et al., 2001). In this research, this meant constantly stepping back and asking whether concepts and relationships were actually grounded in the data or were imposed by preconceived knowledge.

As has been reinforced by various authors (e.g., Woodman et al., 1993; Couger & Higgins, 1993), the so-called 4Ps (creative product, creative person, creative process, and creative press or environment) need to be considered when studying organizational creativity and are central concepts in theories on creativity at individual, group, and organizational levels (Firestien, 1993; Runco, 2007; Isaksen, 1987; Rhodes, 1961; Brown, 1989). This knowledge served as a sensitizing device (Klein & Myers, 1999; Walsham, 1995). It thus became part of the iterative process of collecting and analyzing data in order to build theory (Walsham, 1995). This is in conformance with Walsham (1995) who states that it "is possible to access existing knowledge of theory in a particular subject domain without being trapped in the view that it represents final truth in that area" (p. 77). Later in the study existent theories on creative processes, creative products, creative persons, and the creative environment were considered in order to engage with existent theory and proceed to more general substantive theory.

## **4 Study Findings: Categories**

The nascent theory is introduced in two steps. First, relevant categories are described along with their properties and dimensions (section 4.1). Second, relationships between these categories are described in the form of an integrated theoretical scheme (section 4.2). Based on the above discussion on the coding scheme, the categories are presented in four groups: the core category, categories providing the organizational context, strategies, and consequences (Strauss & Corbin, 1998).

For the different concepts, exemplary evidence in the form of comments from the interviews or findings from the process analysis is provided. Appendix A provides an overview of open codes that led to the formation of categories and properties.

## 4.1 Core Category

The core category represents the study’s central theme (Strauss & Corbin, 1998). The central phenomenon of this study is represented by the category of the *creativity-intensive process*. Contextual factors, strategies, and consequences pertain to the central phenomenon. The identification of the creativity-intensive process as the core category of this research reflects the researcher’s interpretation of what this research is all about (Strauss & Corbin, 1998). The choice was also determined by the research problem and research questions that were targeted by this research endeavor. The actual conceptualization, however, emerged from the data. The labeling of the category of the creativity-intensive process indicates that the notion of the creative process would not be sufficient to describe the phenomenon under investigation. In fact, business processes in the case organizations comprise of both creative parts and non-creative parts, which is captured by the property of *varying levels of structure*. Other properties could be identified that give the category variation and thus allow for accommodating a broad range of processes. Table 3 details the category of the creativity-intensive process by providing an overview of its general properties.

**Table 3:** Properties of the category of the creativity-intensive process

Property	Description	Exemplary data
<i>Uncertainty with regard to outcome</i>	Certain characteristics of the creative product, as the outcome of a creativity-intensive process, are not known in advance. Uncertainty with regard to outcome varies on a dimensional range from low to high.	“After you got it, you can cast some judgment over whether or not it is appropriate, but you can’t sit down before you start and define the outcome in a sort of objective, measurable way.” (Organization B)
<i>Uncertainty with regard to process structure</i>	Process structure (required process steps, number of iterations, process flow) of creativity-intensive processes is often not known in advance.	“I would denote creativity by arriving at the end of a process without necessarily having a pre-structured guide or a series of processes to get there.” (Organization C)
<i>Uncertainty with regard to required resources</i>	Required resources in creativity-intensive processes are often not fully known in advance. Uncertainty with regard to required resources varies on a dimensional range from low to high.	In the post production processes of Organization A, for example, it may result that additional footage is needed to complete the edit, requiring additional time and budget.
<i>Varying levels of structure</i>	Parts of a creativity-intensive process have a predetermined structure while other parts do not. Creativity-intensive processes thus comprise of both unstructured, hard-to-predict, largely creative sections and well-structured sections at the same time.	“I would say that even when you look at something that sounds as complex as blowing up a building, there will be elements to that work that you could have done before.” (Organization B)
<i>Creative risk</i>	This property denotes the probability of the occurrence of an unwanted consequence which is mainly due to uncertainty with regard to process outcome and different subjective perceptions of this outcome. Creative risk varies on a dimensional range from low to high.	“You can go down a process and you might not get something that the client likes. And then you are kind of in an awkward position ...” (Organization B)
<i>Operational risk</i>	This property denotes the probability of the occurrence of process-related errors, such as a mismatch between the requirements of the crea-	“So they spent a couple of months to build the thing up, and it looked fantastic, took it to the director, and the direc-

	<p>tive product and the creative organization’s capabilities. Operational risk varies on a dimensional range from low to high.</p>	<p>tor said, ‘it’s great, I love it, but it needs to be at least ten times as big.’ At that point they realized that they should have worked that out earlier. Because their whole approach was predicated on the fact that they thought they were going well big enough.” (Organization B)</p>
<p><i>Creative potential</i></p>	<p>The creative potential denotes the process’ capacity of generating products that are truly creative, i.e. that are characterized by high degrees of novelty or originality.</p>	<p>“I have to try and understand what the client wants and sometimes it becomes less creative if I have a very, very clear brief.” (Organization C)</p>

## 4.2 Categories Providing the Organizational Context

The coding paradigm as well as the sensitizing device advocated considering the context of the processes under investigation in particular. Each of the following categories refers to a given phenomenon and can be linked to the creativity-intensive process as the core category of this research. Thus, they are an “abstract representation of an event, object, or action/interaction” (Strauss & Corbin, 1998).

The study revealed three roles as being particularly relevant in the context of the investigated business processes: artists, creative supervisors, and clients. Moreover, the study revealed that organizational resources, including IT, as well as the creative product, are part of the complex context in which creativity-intensive processes are carried out and measured.

### 4.2.1 Artist

Within the study, various people were identified who act creatively, such as producers, offline editors, VFX artists, or directors, who share different properties such as creative skills or motivation. These people act in the role of what was conceptualized as *artists*. Artists in the case organizations carry out creative tasks collectively within business processes in order to generate creative products. Table 4 details the category *artist* by providing an overview of its properties.

**Table 4:** Properties of the category of the artist

Property	Description	Exemplary data
<i>Process expertise</i>	The property refers to a person’s capability of assessing, breaking down, and carrying out a certain process. Process expertise varies on a dimensional range from low to high.	“It’s a complete skill to know how long it takes you to do something, you know. And there are some great artists who can’t.” (Organization B)
<i>Creative skills</i>	This property refers to a person’s ability to generate products that are both novel and purposeful, as well as a person’s capability of aesthetically judging a product. The creative skills of artists vary on a dimensional range from low to high.	“Some people would just get a skeleton and the library and modify, other people would make a fantastic skeleton that does all sorts of amazing things and that’s creative and that’s not.” (Organization C)
<i>Working style</i>	Different artists may solve the same problem in different ways, which contributes to uncertainty with regard to outcome, process, and required resources.	“Especially creative people will have their own preferences of how they want to work.” (Organization B)
<i>Motivation</i>	Refers to the artist’s intrinsic motivation; generally, artists need to be challenged creatively. Motivation varies on a dimensional range from low to high.	“So, for example, if someone knows that they are not working on a big box office hit, because we have to do all kinds of work here, that sometimes

<i>Creative agenda</i>	Refers to the artist's desire to pursue certain creative goals that match their sense of aesthetics and creativity.	has a bit of an impact on their motivation. And some people don't care." (Organization C) "Everybody has their own creative agenda. They are trying to push sometimes on their job so you have to try and stem that somehow." (Organization C)
<i>Location</i>	Pertains to the geographical location of artists. At a high level it is possible to distinguish between co-location and geographically distributed location.	"The most successful kind of creative partnerships I think are done face-to-face. But often on a project you won't be face-to-face." (Organization A)
<i>Understanding of the requirements of the creative product</i>	Throughout the creativity-intensive process, artists develop an understanding of the requirements of the creative product which may differ from the client's understanding of these requirements. The understanding of the requirements of the creative product varies on a dimensional range from vague to very detailed.	"And you'll notice that the designers always see things completely differently from each other. Even if somebody's initial ideas are similar, the way that they actually physically design it and put it together is always very different." (Organization C)

#### 4.2.2 Creative Supervisor

In all three case organizations there are certain actors within creativity-intensive processes who have a particularly high level of responsibility for both process and product. This role was conceptualized as the *creative supervisor*. The creative supervisor normally coordinates various artists and reports to a client. Creative supervisors can thus be framed as process intermediaries in creativity-intensive processes. Often there is also a hierarchy of creative supervisors.

Creative supervisors are normally artists themselves as they need to be able to evaluate creative products and to stimulate creativity. However, they often perform less creative work than 'normal' artists, as they are obliged to managing the process as well. Table 5 provides an overview of the category of the *creative supervisor*.

**Table 5:** Properties of the category of the creative supervisor

Property	Description	Exemplary data
<i>Acting as process intermediary</i>	Creative supervisors have a crucial role in building the interface between client organization and creative organization.	"When five or ten people are working on something, and if they are all doing something insanely creative, they have to report back to somebody [...], to make sure that everybody is vaguely going in the same way." (Organization B)
<i>Accountability</i>	Creative supervisors are responsible for both process and product. Thus, they consider both operational and creative process performance. As there are usually different creative supervisors involved in a project, they have varying responsibilities.	"I think you've got different stakeholders. [...] Often in that chain of events you will have different people that are responsible for various elements, but they are often reporting back to a director or back to a producer." (Organization A)
<i>Supervising expertise</i>	Refers to how well a creative supervisor is capable of recognizing what process is appropriate to what situation and what client. Creative supervisors have to know who should be involved in a process at what point in time, how teams should be designed etc. The expertise varies on a dimensional range from novice to very experienced. Another	"I think your flexibility grows as your experience grows as well. The more experience that you've had with a range of clients, the more you know what process to instigate when you come across that kind of client." (Organization B)

facet of a creative supervisor's process expertise is their people skills; i.e., their capacity to motivate creative people. Creative supervisors have to find a balance between assigning relatively non-creative jobs and very creative jobs to creative people, so as to foster their motivation and thus their creativity. Creative supervisors are generally perceived as having high people skills.

*Understanding of the requirements of the creative product*

Creative supervisors develop a certain understanding of the requirements of the creative product. The understanding of the requirements of the creative product varies on a dimensional range from vague to very detailed.

“If you are thinking about the customer you have to – or I have to, I have to try and understand what the customer wants and sometimes it becomes less creative if I have a very, very clear brief.” (Organization C)

### 4.2.3 Client

Creativity-intensive processes are influenced not only by artists and creative supervisors, but also by the client who often has an important creative role within a creativity-intensive process. Clients provide initial requirements specifications for creative products, for example. In most cases clients are not end-consumers but other creative organizations. A VFX company contributes with their creativity to larger projects, such as feature films. Table 6 provides an overview of properties that are shared by clients of creative organizations.

**Table 6:** Properties of the category of the client

Property	Description	Exemplary data
<i>Expertise</i>	Refers to the client's ability to express their requirements, to know the abilities of the creative organization, and to assess creative artifacts. The latter aspect influences at what stage the client can be involved into approval processes and can also be referred to as their visual literacy. The expertise of a client varies on a dimensional range from novice to very experienced.	“Some directors have familiarity with visual effects and some don't. So the ones that don't usually expect a product that it's a little bit more polished. But the ones that understand visual effects are much better at looking at something from the early parts of the process.” (Organization B)
<i>Location</i>	The client location impacts on communication strategies. Geographical distance requires other communication strategies than face-to-face meetings, for example.	For example, clients of Organization B are often studios that are located in the United States while Organization B is located in Australia.
<i>Understanding of the requirements of the creative product</i>	Even though the client usually has some initial idea of what the product should look like, the product's specifics and therefore the client's understanding of these often become evident only when the product is actually generated. The client's understanding of the requirements of the creative product may differ from the artists' understanding.	“Some clients have a really clear vision of what they want. Some clients have no idea what they want and want you to provide them with a very specific set of things.” (Organization B)

### 4.2.4 Constraints and IT Context

In all case organizations there was strong evidence for the importance of constraints that impact on creativity-intensive processes. Time and budget turned out to be most relevant. Table 7 provides an overview.

**Table 7:** Organizational resources: time and budget

Resource	Description	Exemplary data
<i>Time</i>	Available time limits the options that artists can explore in order to generate a creative product. Obviously, there is a close relationship between the resources of time and budget.	“Time. Cause a lot of these things are dependent on being able to spend the appropriate time at various stages and there are some things you can’t rush.” (Organization B)
<i>Budget</i>	The budget is one of the most important resources that impact on the management of processes in the case organizations. For example, budget constraints limit the creative organization to a certain number of iterations of the creative product and also to the use of certain technical equipment.	“A lot of the time it’s dictated by time and budget. Unfortunately, that’s just the way it is and as much as we like to have that whole creative process as an important core thing, it often doesn’t work out that way...” (Organization C)

As the data from all three case organizations suggest, IT plays a prominent role in creativity-intensive processes. Knowledge-related technologies as well as group-communication systems are used to support different strategies. Table 8 provides an overview.

**Table 8:** IT context

Technology	Description	Exemplary data
<i>Knowledge management systems</i>	Because (previous) knowledge is an important factor influencing creativity, knowledge management systems are used for making explicit knowledge available to carry out creativity-intensive processes. This implies the use of tools to locate and interpret knowledge.	“If you need to learn how to render or [how to use] all those tools, about passing the information back and forth, you know, if you know the name for it, you can search for it.” (Organization B)
<i>Asset management systems</i>	Asset management systems are used to facilitate the process of understanding the requirements of the creative product, as well as the actual work. In the process of understanding the requirements, existent artifacts can be used to support communication by showing what has been done before and what could be done. This includes cognitively stimulating both creative people and clients by providing new options and potential associations.	“As we do jobs, and we need to get reference and people say ‘oh, have you seen that ad that Car Company A [company name changed] did,’ or whatever, we get the ad, we put it in [...] a reference library, and you can put it under ‘cars’ or whatever.” (Organization C)
<i>Group communication systems</i>	In most cases, different creative and non-creative actors are involved in creative tasks. Thus, communication between artists, non-creative persons, creative supervisors and clients is essential. Particular challenges arise from geographical distribution, which is typical of processes in the film and VFX production.	“And all it really is, is the ability to draw an image together. It’s a very simple technical problem, but it allows a richness in communication that makes the whole process more effective.” (Organization B)
<i>Workflow-related systems</i>	Different systems such as task lists are used to support processes in the case organizations. For some tasks, such as the production of VFX, highly specialized systems are used to support artists in conducting various steps of the process. The main purpose of such systems is regarded as giving people more time to be creative by supporting repetitive and well-structured parts of creativity-intensive processes.	“So, you know, the better a company is in making those tools, not as, you know, painful, then people have more time to do creative stuff.” (Organization B)
<i>Artist systems</i>	Within creativity-intensive processes, the case organization uses what can be epitomized by the category of artist systems. Artist systems are tools that are used by creative people in order to generate creative artifacts	“And then, there are software tools that do the creative bit and then there are file system tools and everything.” (Organization B).

### 4.2.5 Creative Product

Creative products were identified as being intimately connected with the process. They are generated within a process, are disseminated into the process context, impact this context, and are then further altered within the process. Examples are animations in Organization C, VFX sequences in Organization B, or edit decision lists (an output of the editing process within film post-production) and sound effects in Organization A. Creative products can be regarded as business objects in business processes. They are generated collectively by artists. Creative products are designed for a client. In many cases a creative product is part of a more complex product (such as a feature film). Thus, the requirements of the creative product are often determined by its ability to contribute to a more complex product. Table 9 details the category of the *creative product* by introducing properties that emerged as being salient with regard to the management of creativity-intensive processes.

**Table 9:** Properties of the category of the creative product

Property	Description	Exemplary data
<i>Intermediate product specifics</i>	Often creative products undergo a number of intermediate steps until they are finalized.	Typically, products in all case organizations undergo various iterations.
<i>Final product specifics</i>	The intermediate product specifics become the final product specifics once no additional iterations are needed.	In processes of the case organizations, products are eventually signed off. When a product is signed off, its specifics are not altered anymore.
<i>Quality</i>	Creative products have to meet both technical and creative requirements. The creative quality can be measured by the novelty and appropriateness of the product.	“If you get to a point where you are looking at a product and it’s not what you want, the question is then, do we have the time and the money to fix it? And what sacrifices, if we have the time, but we don’t have the money, what are we sacrificing in terms of quality?” (Organization A)

## 4.3 Strategies

Process managers in creative environments apply and combine various strategies in order to manage their processes. As a consequence, managing creativity-intensive processes is a complex process in itself. Two main categories of managerial practices play a salient role within creativity-intensive processes: *strategies in communicating with the client* and *strategies in internally managing creativity*.

### 4.3.1 Strategies in Communicating with the Client

Strategies in communicating with the client serve different purposes: first, communication with the client is essential to create a mutual understanding of the requirements of the creative product. This includes that the creative organization matches the requirements with the organization’s capabilities and available resources. Second, communication with the client can help to mitigate and even avoid what can be referred to as creative risks. Third, communication with the client is necessary for establishing client trust. Establishing such trust is important as a lack of it can lead to constant intervention and control, resulting in reduced creativity. Table 10 provides an overview.

**Table 10:** Strategies in communicating with the client

Strategy	Description	Exemplary data
<i>Creative brief</i>	The creative brief is done upfront and aims at creating a common understanding of the requirements of the creative product between artists and clients. Interestingly, it is not only about briefing the creative people; creative people can stimulate the client by presenting alternative solutions for a creative product, for example.	“I see my charter in the company to not only try and fulfill a brief in a creative sense for a client, but also help them to think of things they haven’t thought of already. And say, well, that’s bright but if you thought about this, this, this or this?” (Organization C)
<i>Providing stimuli</i>	The creative organization provides stimuli to the client in order to iteratively generate a shared understanding of the project goals. The strategy of providing stimuli is often combined with the strategy of the creative brief.	“The very act of developing modifies what they’re thinking about. And if they have confidence in you, you can show them an image that otherwise they might not like, that they will like. You can change their perception of what you are presenting them by how you present.” (Organization B)
<i>Showing references</i>	Showing references supports the creative brief; it helps to generate a common understanding between creative people and client on where the project is heading. Moreover, it can provide stimuli for coming up with truly creative ideas.	“Listen, in this movie, even if it wasn’t from the studio that we are working with, in this other movie, this was done, we like this effect, but this is how we want to have this [...]” (Organization B)
<i>Showing work in progress</i>	Showing work in progress is a means of continuous communication with the client. Clients are kept up to date to ensure that expectations are met. Showing work in progress is less formal than approval and review processes.	“And when you are having a dialog, you can show them work-in-progress and they can very concretely tell you either ‘that’s it’ or ‘that’s not it.’” (Organization B)
<i>Approval and review</i>	Approval processes are a means of ensuring that the process meets the client’s requirements. Approval processes thus aim to mitigate risk and control the process. There are different types of approval processes. These can involve so-called screenings where clients, creative supervisors, and artists meet face to face.	“I think there is a danger in too much reviewing and intruding into the processes. So that’s why I think normally it’s coming from the top down. It should be at defined points. Clearly defined points.” (Organization B)

#### 4.3.2 Strategies in Internally Managing Creativity-intensive Processes

Creative supervisors manage the creativity-intensive process and must ensure that everybody works towards one goal. Managing creativity can have diverse facets ranging from restricting creativity due to technical and creative constraints to encouraging and motivating creative people to be more creative, and the deliberate allocation of resources. Table 11 provides an overview of strategies in internally managing creativity-intensive processes.

**Table 11:** Strategies in internally managing creativity-intensive processes

Strategy	Description	Exemplary data
<i>Task allocation and team building</i>	First, artists who are allocated to a task must have a certain expertise. Second, task allocation is used in order to facilitate knowledge transfer. By putting junior and senior personnel on the same task, the organization enables the transfer of tacit knowledge. As has been indicated, particularly creative parts of a process are largely characterized by the application of tacit knowledge. An attempt	“There are certain tasks which, if you don’t have a certain level of experience or capability, you just won’t be able to do. So by putting somebody on them, if you misjudge that, you have completely wasted their time on that because you are not going to get anything for it; they are not going to solve the problem



	to find a balance between creatively challenging and rather simple tasks is also made in order to give creative people the opportunity to follow their creative agenda which, in turn, fosters motivation.	and you have to do it with someone else.” (Organization B)
<i>Resource allocation</i>	Particularly time and budget were identified as being important resources in creativity-intensive processes. A lack of time is often associated with lower levels of the quality of the creative product. Thus, creative supervisors try to identify the particularly complex and creative parts of a process so as to allocate sufficient time. Generally, more time enables creative people to explore and come up with various options.	“And in essence, I mean a lot of times, [...] you have just to make sure that there is areas of the show that don’t become a sink of resources, and time, and money.” (Organization B)
<i>Managing the scope of creativity</i>	In most cases it is necessary to channel creativity down the right path as opposed to restricting creativity. It must be ensured that the creativity contributes to the process goals. Often creative organizations have to encourage creativity. One way to achieve this is by applying the aforementioned strategy of showing references in order to provide stimuli to an artist.	“Everybody has their own creative agenda. They are trying to push sometimes on their job so you have to try and stem that somehow; you have to give people latitude to be creative, but not that creative that everybody is driving a project in different ways and it falls over.” (Organization C)
<i>Internal reviews</i>	Creative reviews are primarily meant to mitigate creative and operational risks. Usually, creative reviews involve artists and supervisors who are responsible for a certain artifact or process. It is the supervisor’s responsibility to make sure that the product meets the client’s expectations. Internal reviews are also used to encourage creativity. Thus, this strategy is closely linked to the strategy of managing the scope of creativity.	“Reviews are a good way of setting the bar in both directions; because that person will tell someone ‘that’s not good enough, you need to take it further,’ but they will also tell someone ‘that’s good, you don’t have to take it any further. Let’s take that to the client.’” (Organization B)
<i>Internal breakdown</i>	Creative organizations have to break down creativity-intensive processes into different sub-processes or tasks; they identify what (sub-)processes must be carried out in order to generate a more complex creative product. This step is essential in order to match the requirements of the creative product with the creative organization’s capabilities.	For example, in order to generate a shot with a spider in it, Organization B must create the skeleton of the spider, as well as the spider’s skin. Moreover, the spider needs to be animated, show a certain emotion etc. All these tasks are – highly interrelated – creativity-intensive processes by themselves.

## 4.4 Consequences

Creative organizations use the above introduced strategies as they intend to bring about certain consequences. Table 12 provides an overview of the primary (intended) consequences that occur as a result of the application of the strategies. This implies that there are also unintended consequences, which are dimensional variations of the intended ones (low client satisfaction instead of high client satisfaction, for example).

**Table 12:** Consequences of managing creativity-intensive processes

Consequence	Description	Data
<i>Mutual understanding of requirements</i>	Creative organization (represented by artists and creative supervisors) and clients interact in order to create a mutual understanding of the requirements of the creative product.	“But even if you think you are being really clear, then I can say ‘listen, I think I know what you are asking for and this is some reference that I gathered, that is similar to what you are looking for and I just want to confirm that you are ok with any of these.’” (Organization B)
<i>Mitigating operational and creative risk</i>	Creative organizations seek to mitigate both operational and creative risk. In order to do so they apply strategies in communicating with the	“But you have to be really careful for the things that are a little bit more challenging technically [...].

client and in internally managing creativity-intensive processes.

Thousands of dollars later, you can come up with a product where the client just goes ‘no, that’s not really what I wanted.’ So, we have to identify that process at the beginning.” (Organization B)

*Operational process performance*

Operational process performance refers to classical measures, such as time, budget, and process efficiency. Organizations apply strategies that are known from process management such as process automation and process optimization to achieve these measures.

[...] that it makes good use of the resources I’ve got, rather than requiring me to constantly going on higher resources that I don’t have.” (Organization B)

*Creative process performance*

Creative process performance refers to the creative product. It can be measured by the novelty/appropriateness of the creative product, as well as by the number of outputs generated. The creative performance of a task can be measured by the quality of the creative product; i.e., its novelty and purposefulness.

“I mean that’s how we strive to do the kind of work we do, which we hope is the best kind of stuff that you can get. Like really delivering for our clients and trying to make good commercials that are on world standard. And film and all that stuff that we do is not only being creative and meeting a target, which anybody can really do.” (Organization C)

*Client satisfaction*

Client satisfaction relates both to the creative product and the creative process. To achieve client satisfaction, organizations need to control variables such as time and budget while still delivering a creative product of high quality.

“But as the project is going on, well, we have to make sure, and focus on, first and foremost, that the client is getting what they want.” (Organization B)

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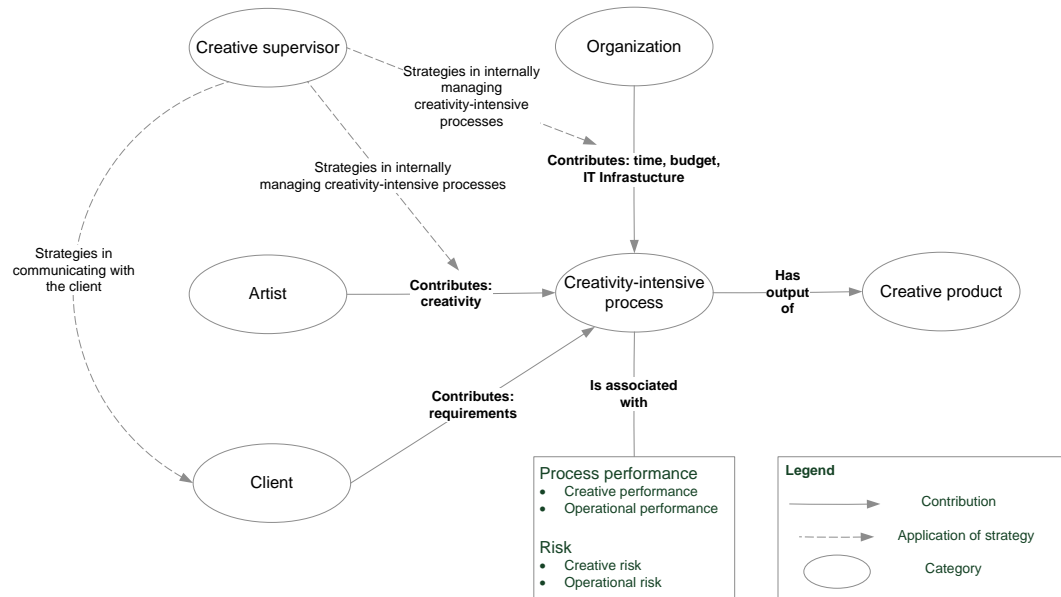
## 5 Study Findings: Integrated Theoretical Scheme

These relationships between the above described categories are now explicated by integrating the categories into a theoretical scheme. As Strauss and Corbin state, “it is not until the major categories are finally integrated to form a larger theoretical scheme that the research findings take the form of a theory” (Strauss & Corbin, 1998, p. 143). The classification above is hence a device that has helped in systematizing the process of theory building.

The key findings of this study are expressed by the means of propositions. It is important to note that these propositions are a means to represent theory that is grounded in the data. It is not subject to this research to test theory. Due to its interpretive nature also narrative is used in order to provide “rich insight” (Walsham, 1995) to the context that has been studied. An overview of the propositions along with the contributing categories can be found in Appendix B. The theoretical model is further illustrated by two figures. The first captures the relationships between the major categories, while the second depicts the dynamics of creativity-intensive processes. The two models complement each other; they provide different perspectives onto the same ideas.

In Figure 2 it is suggested that creativity-intensive processes are carried out as a complex interplay between artists, creative supervisors, clients, and organizational resources. Creative supervisors apply strategies in response to this, as they pursue (a) process performance by meeting constraints such as time and budget (operational process performance) while (b) still being creative and generating products that satisfy client expectations (creative performance). IT is provided by the organization and is used in order to support different strategies as well as to generate creative products. Thus, the view of the IT artifact that is taken in this research can be framed as a tool view; an

“engineered artifact, expected to do what its designers intend it to do” (Orlikowski & Iacono, 2001, p. 123). It is not claimed that the concepts and their relationships presented here are exhaustive.



**Figure 2:** Conceptual relationships between categories

The process typically starts with clients who bring in their understanding of the requirements to a particular creative product. Clients can be end-consumers or creative organizations themselves. Examples of end-consumers are enterprises that entrust the creative organization with the creation of a television commercial. An example of a creative organization as clients is a feature film studio that employs various VFX companies to contribute to a film project. Artists may be a member of a creative group. They bring in their expertise and creative skills – in short, their creativity. Artists utilize resources, most importantly time, budget, and technical equipment, such as the above mentioned artist systems. Creative supervisors manage creativity-intensive processes by applying various strategies in communicating with clients and in internally managing the process. Most of the communication between clients and the creative organization is done through creative supervisors who act as process intermediaries.

Creativity-intensive processes have creative products as an outcome and are associated with process performance (creative and operational) and with risk (creative and operational). Due to different subjective opinions, often ill-defined requirements specifications, and individual characteristics of involved stakeholders, creativity-intensive processes are characterized by uncertainty with regard to outcome, required resources, and process structure.

The study suggests that differing understandings of the requirements of the creative product of clients, artists, and creative supervisors in particular contribute to the uncertainty that is linked to creativity-intensive processes. At one extreme, nothing except for a vague idea is specified. At the other, most features of the product are known in advance. The understanding of the requirements thus ranges from vague to very detailed. The following proposition is suggested:

**Proposition 1:** *Creativity-intensive processes are characterized by uncertainty with regard to process structure, required resources and process outcome. This uncertainty is*

*caused and influenced by various factors, particularly the understanding of the requirements of the creative product of involved clients, artists, and creative supervisors, as well as their individual characteristics (e.g. working style, expertise).*

The uncertainty inherent to creativity-intensive processes was identified as the cause of the closely related properties of *risk* and *creative potential*. The study suggests that high levels of uncertainty are associated with high levels of both operational and creative risk. This uncertainty is not only unwanted, however. It is at the core of creativity as it is a result of diverging from what has been done previously and thus generating products that are associated with high levels of novelty. Thus, high levels of uncertainty are not only associated with high levels of risk, but also have the potential to generate truly novel products as particularly ill-defined requirements allow the creative organization high degrees of freedom. This potential has been epitomized by the property of *creative potential* of the category *creativity-intensive process*.

**Proposition 2:** *High levels of uncertainty in process and outcome are associated with high levels of creative potential; they tend to lead to the generation of products that are characterized by novelty, but also with high levels of operational and creative risk as there may be undesirable consequences, such as client dissatisfaction or a mismatch between capabilities and requirements.*

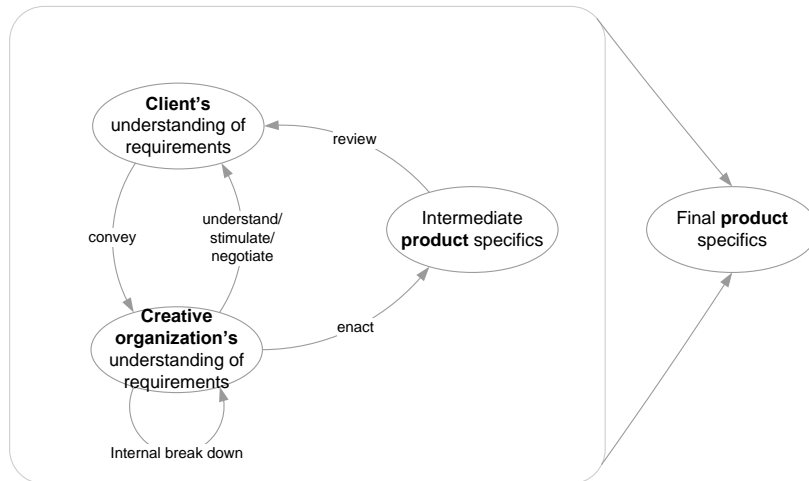
As indicated, the requirements of the creative product are captured by the property of *understanding of the requirements of the creative product* which is shared by the categories of the *client*, the *artist*, and the *creative supervisor*. Consequently, there can be a mismatch between the different understandings of the requirements of the creative product. Obviously such a mismatch is associated with particularly high levels of risk as there is a high probability of client dissatisfaction with the product that is generated.

The study suggests that high levels of expertise and skills of clients, artists, and creative supervisors can mitigate both creative and operational risk. The property of *process expertise* of artists captures abilities such as assessing the required capabilities to carry out a certain task and breaking down a problem. The property of *creative skills* captures their capability of creatively judging creative products. Similarly, clients have a certain level of expertise which impacts how well they are able to convey requirements to a creative product, understand the capabilities of the creative organization, and judge a product even early in the process. Generally, high levels of expertise of members of the creative organization allow them to better understand the client's requirements, assess what is needed to fulfill these requirements, and match the requirements to the capabilities. In consequence, high levels of expertise of involved stakeholders are associated with lower levels of both operational and creative risk.

**Proposition 3:** *High levels of expertise and creative skills of artists, creative supervisors, and clients are associated with lower levels of operational and creative risk. In contrary, low levels of expertise and creative skills of artists, creative supervisors, and clients are associated with higher levels of operational and creative risk.*

In order to understand how the case organizations manage creativity-intensive processes it is necessary to understand the processes' dynamics. Figure 3 suggests that creativity-intensive processes comprise of a number of highly interwoven stages or phases: understanding the requirements,

internally breaking the requirements down, doing work, and evaluating work. Evaluation or review, as well as doing work, are parts of understanding the requirements of the creative product. This means that requirements are not entirely known before the process is completed. The completion in turn results in a final product and measurable process performance. As indicated, this figure complements Figure 2 and presents a different perspective on the same ideas. Whereas Figure 2 depicts the relationships and interactions between the different categories, Figure 3 depicts the dynamics of creativity-intensive processes.



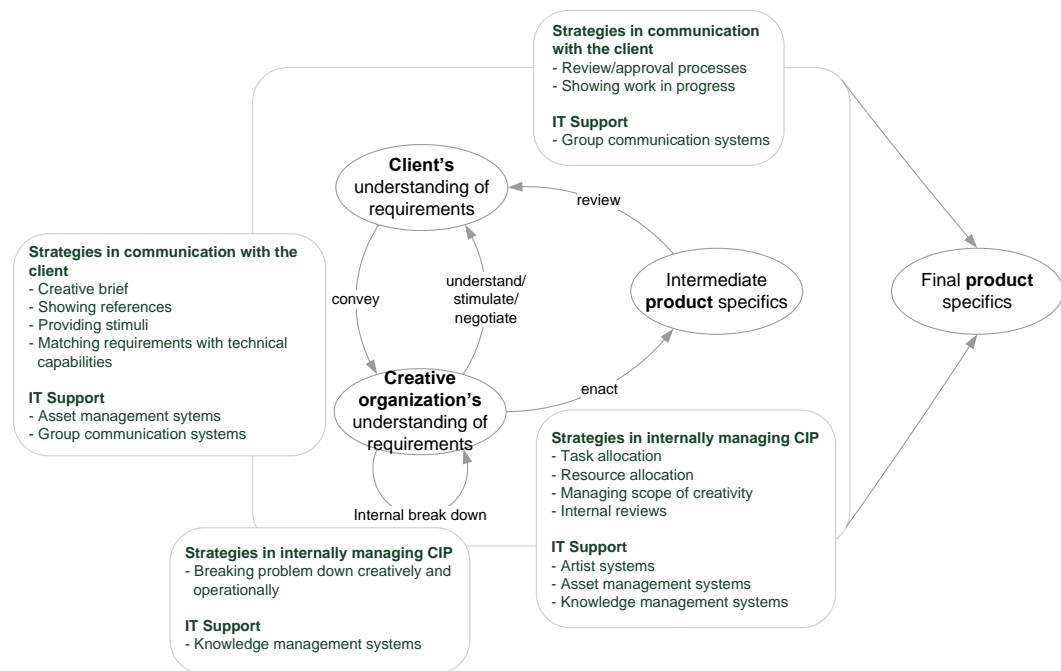
**Figure 3:** The dynamics of creativity-intensive processes

As stated in the previous section, the study suggests that there are two different facets of the requirements specifications of the creative product: First, the client's understanding of the requirements and, second, the artist's or creative supervisor's understanding of these requirements (represented in Figure 3 by the creative organization's understanding of the requirements). The client's understanding of his/her own requirements (property of the client) can be seen as the *raison d'être* for carrying out the creativity-intensive process. This understanding is conveyed to, and understood by, the creative organization (usually by the creative supervisor as a process intermediary) and forms their understanding of the client's requirements (epitomized by according properties of creative supervisor and artist). Based on this understanding, the process is enacted and an (intermediate) product is created. The specifics/quality of the creative product (property of the creative product) is accordingly impacted. The product is only intermediate because it needs to be reviewed. This review may further impact the client's understanding of his/her own requirements which is then conveyed to/understood by the creative organization and so on.

The data further suggests that processes in the case organizations comprise of both well-structured and predictable parts (that often do not involve any creativity at all), as well as creative parts. In VFX production, for example, the so-called production pipeline is a process that generates a particular VFX, such as an animated character. At the highest level, the process is characterized by uncertainty with regard to outcome, process, and resources. Yet, to accomplish the task, various discrete tasks (or sub-processes) must be carried out. Some of these discrete elements can be viewed as well-structured sub-processes with defined outcomes, whereas others are highly creative. The latter ones can be viewed as creativity-intensive (sub-) processes by themselves. Thus, at

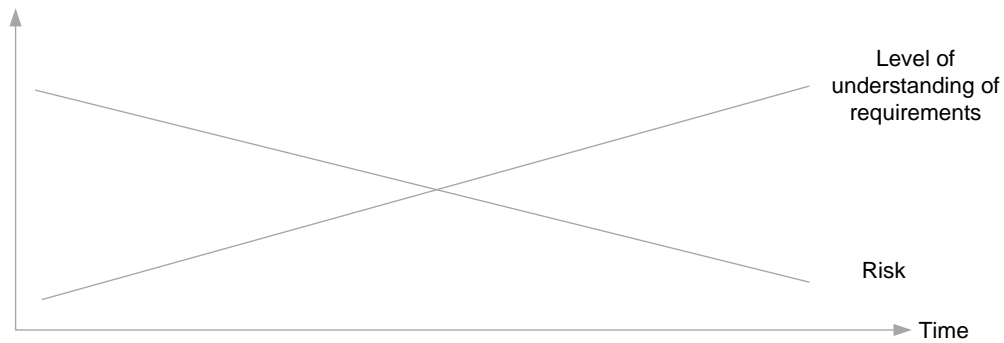
the highest level there is a complex creativity-intensive process of which neither outcome nor structure or required resources may be entirely predictable. At the other end, there is the creative process of an individual, such as generating a particular idea for a VFX.

As has been indicated, organizations apply different strategies in order to manage creativity-intensive processes in order to attain the two primary goals of operational and creative process performance while simultaneously mitigating operational and creative risk. As shown in Figure 4, the strategies as well as the IT context that were introduced in a previous section can be related to the different stages of creativity-intensive processes. As has been maintained, it can be distinguished between strategies in managing communication with the client and strategies in internally managing creativity-intensive processes.



**Figure 4:** Strategies and IT used in managing creativity-intensive processes

As the requirements of the creative product evolve throughout the process, the degrees of freedom as well as associated risk are highest at the outset when almost any thought is permissible. Figure 5 provides an overview of how requirements and risk develop throughout the process. The model is a simplification in that it describes how the understanding of requirements and the associated risk ideally develop throughout the processes, if the creative organization successfully (a) develops a good understanding of the client's vision and matches the requirements with the capabilities, (b) breaks down the problem creatively and operationally, (c) manages the process of generating the product, and (d) reviews the product throughout the process.



**Figure 5:** Development of level of requirements specifications and risk in creativity-intensive processes

## 5.1 Managing Communication with the Client

The primary cause for the need to apply strategies in communication with the client must be seen in the high uncertainty that is related to structure, resource consumption, and outcome of creativity-intensive processes. As indicated, this uncertainty is in turn caused by vague requirements specifications and individual characteristics of involved stakeholders (artists, creative supervisors, and clients). Through their communication, creative organizations and clients seek to develop what has been conceptualized as a *mutual understanding of the requirements* of the creative product. High levels of a mutual understanding between clients and creative organizations are associated with lower levels of risk, as the probability of the occurrence of unwanted consequences such as client dissatisfaction decreases.

**Proposition 4:** *Strategies in communication with the client can further the mutual understanding of requirements of the creative product as well as matching the requirements to the organization's capabilities and available resources, which in turn leads to risk mitigation and higher client satisfaction.*

In order to decide on where within the overall process the particular strategies are applied, creative organizations seek to understand where within the process they best communicate with the client. The data suggests that clients need to be involved particularly in the more creative parts of the process; i.e., those parts where there is a lot of uncertainty and thus decisions of high creative impact are made. There is a particular tendency for this to happen at the beginning of creativity-intensive processes. Often, the creative product is developed in an interactive process between creative organization and the client. At the beginning of this process there is the so-called creative brief. Within this process creative organizations even try to stimulate the client's imagination by means of the already mentioned strategy of *showing references* to previously created products so as to come up with ideas that are both novel and appropriate and thus meet client expectations. Thus, the process of understanding the requirements can be described as a negotiation process between creative organization and clients.

The study further suggests that the abilities and professional background of the clients have to be considered when managing creativity-intensive processes. Whereas some clients are capable of seeing where a process is heading very early, other clients need to be shown a nearly finished product. These abilities are captured by the property of *expertise* of the client. Also the nature of

the creative product influences how and where the client can be involved. A creative director from Organization C put it as follows:

*Sometimes it's a job where it's very, very easy to make something, prototype something very quickly. And there is sometimes a job where there's thousands of computing hours involved... (Organization C)*

While in the first case the organization can show the client a prototype very quickly, the organization would work with references to previously created artifacts or with style frames of the artifact that is being developed in the second, so as to facilitate communication with the client. Based on these findings the following proposition is suggested:

**Proposition 5:** *Particularly tasks with high levels of uncertainty (and thus high creative potential) require intensive communication with the client in order to create a mutual understanding of process goals and thus mitigate creative risk, that is, the occurrence of unwanted consequences, such as client dissatisfaction.*

With regard to the use of IT in this context, the study suggests that *group communication systems* can be used to support strategies such as showing work in progress and evaluation of creative products. Group communication systems allow for higher numbers of iterations while simultaneously mitigating creative risk by constantly providing work in progress to the client.

**Proposition 6:** *Group communication systems allow for higher numbers of iterations of the creative product as well as ongoing communication, thereby facilitating the process of creating a mutual understanding of the requirements to a creative product which in turn leads to risk mitigation and improved client satisfaction.*

Moreover, *asset management* systems are used by creative organizations to access existing assets and contents that can be applied in the process of communicating with clients. As indicated, such assets are used to provide reference in order to stimulate the client and negotiate requirements of the creative product.

**Proposition 7:** *Asset management systems can be used to access existing assets that can then be applied in the process of communicating with clients, thereby facilitating the process of creating a mutual understanding of requirements of the creative product which in turn leads to risk mitigation and improved client satisfaction.*

## 5.2 Internally Managing Creativity-intensive Processes

As has been maintained, creative supervisors have to manage a process that is characterized by the interplay of artists. In the following, strategies and information technologies are discussed that are applied to manage creativity-intensive processes internally (Figure 4). There is a close association with the relationship and interaction between clients and creative organization (i.e. the strategies described above). The study suggests that creative organizations apply strategies in internally managing creativity-intensive processes in order to pursue both operational and creative process performance while simultaneously mitigating operational and creative risk.

**Proposition 8:** *Strategies in matching capabilities with requirements, managing the scope of creativity, resource allocation, and internal review lead to enhanced operational and creative process performance and the mitigation of creative and operational risk.*



The level of creativity associated with a creative task is restricted by requirements specifications as well as available resources, such as time and budget. The creative supervisor must, however, ensure that all participants work towards one goal, particularly when different creative teams are working together. In some cases this requires the creative supervisor to encourage people to be more creative (to generate products that diverge from what has been done before), whereas in some cases creativity needs to be restricted. One supervisor put it as follows: “...everybody has their own creative agenda. They are trying to push sometimes on their job so you have to try and stem that somehow; you have to give people latitude to be creative, but not that creative that everybody is driving a project in different ways and it falls over.” Thus, the strategy of *managing the scope of creativity* varies on a dimensional range from restricting creativity to encouraging people to be more creative. Review processes are not only used in order to communicate with the client (compare previous section), but also used internally, both for quality assurance (technical aspects) and for internal creative feedback. For external review processes, the intended consequence is likewise to meet requirements specifications and to mitigate risk (by recognizing errors early in the process, for example). Particularly where high latitude is allowed by management, both internal and external approval processes are needed, so as to avoid unwanted consequences; i.e., to mitigate risk.

Another important strategy is that of *resource allocation*. Creative supervisors have to decide what resources are allocated to what task. Often, resources are allocated to tasks with particularly high creative impact. If there is a lack of resources for a creative task, creativity can be compromised. The study suggests that asset management systems are used to access existing assets that are then used in order to generate creative products. As the following quote exemplifies, in many cases being creative means to draw from artifacts and ideas that have been created previously:

*I think creativity can still be drawing together other things that have been quite pre-determined, you know, but putting them into a new arrangement. That's the same as creativity as well. Everything you draw on, everything I draw on in my creativity comes from somewhere. So it's already been created somewhere... (Organization C)*

Thus, supporting creativity-intensive processes with asset management systems can increase productivity and creative output.

***Proposition 9:*** *Asset management and content management systems can be used in order to facilitate access to existing assets and contents that can be used to provide reference and can also be reused. Thus, these systems can facilitate the process of generating the creative product and positively influence creative and operational process performance.*

Moreover, different systems such as task lists are used to support processes in the case organizations. For some tasks, such as the production of VFX, highly specialized systems are used to support artists in conducting various steps of the process. The main purpose of such systems is regarded as that of giving people more time to be creative, by supporting repetitive and well-structured parts of creativity-intensive processes, while simultaneously handling the complexity of artifacts (particularly in VFX production and animation, sequences consists of hundreds of artifacts). However, no comprehensive process support for entire processes is used. The study sug-

gests that this is due to the high demand for flexibility in creativity-intensive processes. These tend not to have a pre-determined process flow and are characterized by many possible exceptions.

***Proposition 10:** Workflow-related systems such as task lists can be utilized to facilitate the process performance of creativity-intensive processes by handling the complexity of creative artifacts and supporting the well-structured and pre-determined parts of the processes. In turn, such systems provide creative people with more time to be creative, thereby resulting in higher creative and operational process performance which in turn leads to increased client satisfaction.*

Moreover, *knowledge management* systems are used in both Organizations B and C. Much of the knowledge that is applied within creativity-intensive processes is tacit knowledge, often of free-lancing people. Organizations thus seek to explicate and store this knowledge in knowledge bases in order to make it available for the organization. The study suggests that knowledge management systems can help to transfer knowledge among artists and can be particularly useful in supporting operational process performance.

***Proposition 11:** The use of knowledge management systems enables to store and access explicit knowledge which can be applied in creativity-intensive processes, thereby leading to enhanced operational process performance.*

## **6 Relating the Theory to the Literature**

It is hoped that engaging with aspects of existent formal theory will facilitate a more general theory (Eisenhardt, 1989; Glaser and Strauss, 1967; Orlikowski, 1993). Thus, concepts and relationships that emerged from this study are compared with those that were identified in the related literature. Given the vast amount of literature in these areas, this attempt cannot be seen as exhaustive.

### **6.1 Relating the Theory to the BPM Literature**

Davenport (2005) introduces a classification scheme for knowledge work processes which distinguishes the two dimensions of collaboration and work complexity, leading to four distinct types of knowledge-intensive processes (transaction model, integration model, expert model, and collaboration model) that are associated with four types of knowledge workers (transaction workers, integration workers, expert workers, and collaboration workers). With regard to this model, creativity-intensive processes in the discussed substantive area are closely related to the collaboration model. Processes belonging to the collaboration model are characterized by improvisational work, high reliance on expertise and fluid deployment of flexible teams – attributes that also apply for the creativity-intensive processes that were investigated in the present study.

Harmon (2007) introduces a continuum where ‘ordinary workers’ work on simple procedural processes, knowledge-workers on more complex processes, and so-called experts work on unique and extremely challenging processes. Harmon (2007) characterizes a knowledge worker as someone who “employs a few hundred rules to solve the problems he or she encounters” (p. 279). Knowledge workers thus apply processes of convergent, rule-based thinking to solve their prob-

lems. Experts, on the other hand, usually work on problems that require very complex cognitive networks employing a vast number of rules and, in many cases, explore new territory, i.e. if the required rules, procedures, and business partners do not even exist. Even though there are similarities between the investigated creativity-intensive processes and what Harmon (2007) describes as the work of experts, the present study discusses certain particularities of creativity-intensive processes. In particular, such processes are characterized by high levels of uncertainty which result in both creative and operational risk. One main reason is the application of both divergent and convergent thinking. Thus, creativity-intensive processes not only solve problems, they solve problems in novel ways which require artists to diverge from what has been done before.

In summary, the theory presented in this study advances the ongoing discussion on knowledge-work and human centric processes by focusing on those processes that are very much characterized by creativity and the generation of creative products.

## **6.2 Relating the Theory to the Literature on Creativity and Creativity Management**

The tri-partition between individual, views, group level views, and organizational views of creativity (Borghini, 2005; Drazin et al., 1999) is now used to engage with the literature at different levels of analysis. Thereafter, the emergent theory is related to two influential multilevel-models that consider different levels of analysis. Finally, literature on practices in managing creativity is considered.

### **6.2.1 Individual Views**

Individual views of creativity focus on creative persons and their personality (Barron & Harrington, 1981; Martindale, 1989), cognitive abilities (Guilford, 1983), motivation (Amabile, 1990), and knowledge (Amabile, 1988). Prominent examples are tests of divergent thinking, as proposed by Guilford (1956), or the study of biographical and historical background of persons who showed outstanding creativity (Galton, 1869; Simonoton, 1975).

Individual views of creativity in particular contribute to a more comprehensive explanation of the categories of the artist and the creative supervisor. The present study revealed rather abstract properties such as *process expertise* and *creative skills* and explained how they need to be considered by creative supervisors when managing the process. While the study reveals how these abilities impact on business processes and their management, it does not provide in-depth explanations of how, for example, cognitive factors or knowledge contribute to a person's individual creativity.

### **6.2.2 Group Level Views**

At the group level, the literature suggests various characteristics of successful creative groups, such as leadership, group composition, group structure, cohesiveness, and resource availability (King & Anderson, 1990; Payne, 1990). Generally, creative groups should be heterogeneous and not too large (Amabile, 1998) and leadership should be democratic and collaborative so as to allow for maximal creative performance (King & Anderson, 1990). With regard to the present study, this

has implications for the role of the creative supervisor in particular, as interventions such as internal approval steps may be kept to a minimum. As indicated, other factors such as requirement specifications or available resources may force a tradeoff. If very creative (heterogeneous, democratic) groups carry out certain tasks, there also will be a tendency towards high variances in process and outcome. Thus, creative supervisors need to decide carefully where, within the creativity-intensive process, high variance is desirable so that products with a high level of creativity are created.

Williams and Yang (1999) conclude that there is a conflict between “the creative thinker whose ideas are fostered through solitary, focused work” and the “team-oriented, organizational leader who focuses squarely on working with others within the system” (p. 389). This view has been reinforced by this study, though not to such an extreme extent. In the case organizations, all creative workers who were interviewed perceived themselves as team players contributing to a creative process. However, the role of the creative supervisor as the team-oriented leader, turned out to be crucial for both accomplishing operational performance, such as resource efficiency and time, as well as creative performance.

### *6.2.3 Organizational Level Views*

At the organizational level, the literature reveals factors that influence what can be referred to as the organizational climate which in turn influences creative performance (Runco, 2007; Ryhammer & Smith, 1999). Important factors are encouraging risk taking, supporting the free exchange of ideas, legitimization of conflicts, or the separation of the generation of creative products and their evaluation. The final factor, for example, could be observed in the case studies in the form of strategies such as approval processes. A climate of risk taking was likewise observed, as organizations are aware of creative risks but seek to mitigate these by implementing according strategies. Thus, a process-oriented perspective enables process owners to explicitly allow risk taking where it is needed within the process by allowing higher levels of creativity while still being able to not entirely lose control of the process. Altogether, the proposed theoretical framework can be enhanced in that the organization not only contributes resources and IT infrastructure but also the organizational climate.

### *6.2.4 Multilevel Views*

With regard to the aforementioned multilevel-theories, in the following the influential work of Woodman et al. (1993) and Drazin (1999) is considered in particular.

Borghini (2005) stated that “at present only the model proposed by Woodman et al. (Woodman et al., 1993) offers a broad vision of the problem that approaches a systemic view” (p. 22). At the organizational level, creativity is “a function of the creative outputs of its [the organization’s] component groups and contextual influences” (Woodman et al., 1993). At the same time, group creativity is a function of the individual creativity. The model of Woodman et al. (1993) can thus be framed as a functionalist model which views creative outcome at the dependent variable (Drazin et al., 1999). The present model, in contrast, particularly considers the dynamics of creativity-

intensive processes including required process steps, potential iterations, as well as strategies and IT systems that organizations use throughout the process.

Drazin et al. (1999) define creativity as a sensemaking process at the individual, group, and organizational level, rather than an outcome. They investigate an exemplary setting that they describe as “an interdependent, complex, large scale, long duration organizational project” (p. 287). In contrast to their investigation, the present study investigated what has been framed as highly dependent on creativity, interdependent, intensively involving the client, and complex.

In summary, the theory of creativity-intensive processes as proposed in this paper can be seen to complement other models, such as that of Woodman et al. (1993). While the latter, for example, proposes a functionalist approach to organizational creativity, the model presented in this study proposes a process-centric view which also considers different consequences, such as operational process performance. It has been argued that it cannot be assumed that creative organizations have a sole focus on creative performance. Thus, the business-process-oriented view of this study offers a new perspective on creativity within organizations, as it involves individual, group, and organizational, as well as creative and non-creative factors at the same time.

### *6.2.5 Managerial Practices*

Theoretical models are the pre-requisite to understanding how creativity and creative behavior occurs and how it can be managed. As maintained above, these theories in particular reveal independent variables that influence the creative outcome or a process. Consequently, some studies, both from the literature on creativity and innovation, have paid special attention on how creativity and innovation can be managed by discussing actual managerial practices (e.g. Amabile, 1998; Styhre & Sundgren, 2005; Tan, 1998). Amabile (1998), for example, identifies six categories of such managerial practices that can foster creativity. These are challenge, freedom, resources, work-group features, supervisory encouragement, and organizational support. By consciously making management decisions with regard to these areas, organizations can particularly foster intrinsic motivation and thus positively influence the creative outcome.

Thus, existent studies focus on explaining how creativity can be fostered by the application of various management practices. Even though these studies can be of great benefit to managers who are responsible for business processes, they do not explain how the occurrence of creativity impacts the business process and how these end-to-end business processes involving individuals, groups, IT, and other resources can effectively be managed. As stated earlier, process managers are compelled to not only foster creative output, but also follow business imperatives such as time and budget, but must also consider and allocate available resources. The present study thus provides a substantive account of managerial practices and relates these practices to the different stages of creativity-intensive processes and the use of IT in particular.

# 7 Conclusion and Outlook

## 7.1 Implications for IS Research

The proposed framework is based on empirical data that was collected in a substantive area within three organizations from film and visual effects production being part of the creative industries. Such substantive theory explains the phenomenon of creativity-intensive processes under certain circumstances in a certain area (Strauss & Corbin, 1998; Urquhart, 2001). Thus, the question arises of how to proceed to a more general substantive or even formal theory. Two strategies for further research are proposed.

First, more empirical evidence is necessary to show whether the proposed framework is also applicable to other domains. Of particular interest are those industries where creativity and innovation play a crucial role. Prominent examples are software development or research and development of drugs and biotech products. Existent literature from the IS discipline nurtures this assertion. Maiden (2004), for example, highlights the function of creativity within the process of requirements engineering in software development. Software development generally aims to generate products that are both novel and purposeful. Thus, there are parallels to what has been identified as creativity-intensive processes in the substantive area of film and VFX production.

It is also proposed to examine organizations that are not creative at first sight but increasingly rely on creativity. Examples are industries such as insurance which also employ creativity-intensive processes in areas such as product development. To summarize, there is a need to investigate different contexts where creativity is part of business processes. It is hoped that this will enable researchers to examine these different contexts for their similarities and differences and thus draw conclusions regarding managing creativity-intensive processes in general. It may turn out, for example, that categories and relationships need to be refined or that additional dimensions are required to account for differences in contextual settings (Orlikowski, 1993). The proposed theoretical framework can serve as a conceptual framework to conduct such empirical research.

Second, aside from collecting and analyzing further empirical evidence, another way of proceeding to a more general substantive theory is to engage with existent theory. This has been done so to some extent by engaging with theories within the areas of BPM and creativity research. Yet, it is not claimed that this attempt has been exhaustive. Another approach will be to engage with meta-theories from the information systems discipline (Urquhart, 2007). A potential example is the actor network theory (Callon, 1986) that may help to further substantiate the constituent role of the introduced categories within the complex interplay and contextual setting of creativity-intensive processes.

## 7.2 Implications for the Practice of Business Process Management

The proposed framework is of practical applicability as it fits the substantive area of the study and it is expected to hold a sufficient level of generality to be applicable to a range of processes containing creativity. It is also considered to be understandable to practitioners and to suggest useful advice on how to manage processes that rely on creativity (Glaser & Strauss, 1967; Orlikowski,

1993). Thus, process managers can utilize the framework to analyze their creativity-intensive processes, understand the contextual setting and implement strategies to simultaneously pursue operational process performance and creative process performance.

In particular, the framework provides guidance on how to support different strategies with IT. It is assumed, for example, that the usage of IT, such as group communication systems, in the process of understanding the requirements of the creative product can enable higher numbers of iterations and thus lower costs associated to the process of understanding the requirements. At the same time, a better mutual understanding of the requirements of the creative product leads to reduced risk. In brief, the study suggests that existent technologies such as knowledge management, asset management, group communication support systems, but also workflow-related systems such as task lists are appropriate means to mitigate risk and enhance both operational and creative process performance. It is believed that the theoretical comprehension of creativity-intensive processes can help systems designers to design and implement IT systems for supporting creativity-intensive processes.

### **7.3 Limitations**

Due to the interpretive nature of this research, it cannot be claimed that the phenomenon of creativity within business processes and the management thereof has been described exhaustively. Potentially relevant conditions, strategies, IT systems, and consequences may not have been accounted for. The role of the researcher in this study is to be seen as that of an “outside observer” (Walsham, 1995). Whilst this may have helped to convey views expressed to someone who did not have a “direct personal stake,” the researchers have obviously only been present at relatively few occasions and there are also many stakeholders who could not be interviewed.

Regarding the analytic scheme, it has to be acknowledged that codes may be differently interpreted by different people. Also two analysts were involved in the coding process, only one analyst conducted the entire coding phase. Thus, much of the analysis depended on the author of this study. Given the interpretive stance of this research, however, the main concern lies in the question of whether the codes are plausible (Urquhart, 2001).

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## Appendix

### Appendix A

The following table provides an overview of low level (open) codes that led to the formation of categories and properties. Please note that the study provided further open codes that were however not grouped under the concepts that were presented in this study and are therefore not included in the following table.

<b>Node/concept properties</b>	<b>(categories, subcategories, Open codes)</b>
<b>(1) Core category</b>	-
<b>(1.1) Creativity-intensive process</b>	-

<b>Node/concept properties)</b>	<b>(categories, subcategories, Open codes</b>
(1.1.1) <i>Uncertainty with regard to outcome</i>	<i>Conflict potential, disagreement, individual opinion, judgment, making creative judgments, no objective way in defining the outcome, variance in outcome, bringing something individual to it</i>
(1.1.2) <i>Uncertainty with regard to process</i>	<i>Bringing something individual to it, individuality, latitude, low predictability, tackling new work, variance in process, doing things differently, flexibility, jumping process steps, process choices, varying numbers of iterations, not having a pre-structured guide, thinking laterally</i>
(1.1.3) <i>Uncertainty with regard to required resources</i>	<i>Flexibility of resource use, doing things differently</i>
(1.1.4) <i>Varying levels of structure</i>	<i>Creative tasks, technical tasks, granularity, inherent process steps, sub-processes, recurrent elements, patterns</i>
(1.1.5) <i>Creative risk</i>	<i>Changing mind, client dissatisfaction, conflict situation, generating no outcome, lack of approval, lack of communication, no obvious metric of completion</i>
(1.1.6) <i>Operational risk</i>	<i>Exceeding time and budget, getting caught focusing on execution, mismatch between requirements and capabilities</i>
(1.1.7) <i>Creative potential</i>	<i>Level of creativity, open end, space for exploration, creativity constraints</i>
<b>(2) Contextual factors</b>	-
<b>(2.1) Artist</b>	<i>VFX artists, editor, sound editor, compositor</i>
(2.1.1) <i>Process expertise</i>	<i>Ability to break problems down, ability to carry out a process, ability to assess a process, experience, capability, creative problem solving</i>
(2.1.2) <i>Creative skills</i>	<i>Ability to see, aesthetic judgment, creativeness, experience, having an eye, creative problem solving</i>
(2.1.3) <i>Working style</i>	<i>Preferences</i>
(2.1.4) <i>Motivation</i>	<i>Being attached to a project, feeling happy, negative criticism</i>
(2.1.5) <i>Creative agenda</i>	<i>Craving for creativity, fulfilling personal expectations, desiring a free reign</i>
(2.1.6) <i>Location</i>	-
(2.1.7) <i>Understanding of the requirements of the creative product</i>	<i>Seeing things differently, no objective way in defining the outcome, differing interpretations</i>
<b>(2.2) Creative supervisor</b>	<i>Lead, VFX supervisor, producer, team leader</i>
(2.2.1) <i>Acting as process intermediary</i>	<i>Enabling people, getting feedback from clients, interface to client, mediating between client and artist, mediating different creative points of view, passing information back and forth, passing on information, delivering to the client</i>

<b>Node/concept properties)</b>	<b>(categories, subcategories, Open codes</b>
(2.2.2) <i>Accountability</i>	<i>Creative control, financial accountability, having the final say, level of the hierarchy, making final decisions, making sure that creative objectives are being hit, reporting back, responsibility, passing accountability down</i>
(2.2.3) <i>Supervising expertise</i>	<i>Communication skills, experience, negotiation skills, people skills, unintrusiveness</i>
(2.2.5) <i>Understanding of the requirements of the creative product</i>	<i>Differing interpretations, no objective way in defining the outcome, understanding what the client wants</i>
<b>(2.3) Client</b>	<i>Director, marketing agency, feature film studio</i>
(2.3.1) <i>Expertise</i>	<i>Visual literacy, visual knowledge, familiarity with the process, creative ability, creative potential, being able to meaningfully contribute, understanding where the process is going</i>
(2.3.3) <i>Location</i>	<i>Co-location, geographical distance, face-to-face</i>
(2.3.4) <i>Understanding of requirements of the creative product</i>	<i>Client vision, creative input, having an idea of what something should be</i>
<b>(2.4) Constraints</b>	-
(2.4.1) <i>Time</i>	<i>Spending appropriate time, time constraints, lack of time, time for creative exploration, being overburdened</i>
(2.4.2) <i>Budget</i>	<i>Budget constraints, lack of money, putting in more money</i>
<b>(2.5) IT Context</b>	-
(2.5.1) <i>Knowledge management systems</i>	<i>Accessing documentation, blogging, organizing information, populate the knowledge base, search engine, understand how other people solved problems, wiki, decentralization of knowledge, searching for information, shared ontology</i>
(2.5.2) <i>Asset management systems</i>	<i>Free texture sites, getting reference, Google search, Internet, reference library, drawing on existent assets</i>
(2.5.3) <i>Group communication systems</i>	<i>Communication channels, dissemination of feedback, enabling iterations, richness in communication</i>
(2.5.4) <i>Workflow-related systems</i>	<i>Job tracking system, process support, providing deadlines, providing templates, scheduling, task lists, tracking the process, giving people time to be creative, ticketing system for technical support</i>
(2.5.5) <i>Artist systems</i>	<i>Computer-aided design, editing suite, 2D modeling, 3D modeling, graphics editor, rendering</i>
<b>(2.6) Creative product</b>	
(2.6.1) <i>Intermediate product specifics</i>	<i>Getting an image out quickly, not leaping to the solution too soon, testing out</i>

<b>Node/concept properties)</b>	<b>(categories, subcategories, Open codes</b>
<i>(2.6.2) Final product specifics</i>	<i>Getting something subjective final, sign-off</i>
<i>(2.6.3) Quality</i>	<i>Measuring product quality, novelty, perceived creative quality, subjectivity, technical quality</i>
<b>(3) Strategies</b>	-
<b><i>(3.1) Strategies in communicating with the client</i></b>	-
<i>(3.1.1) Creative brief</i>	-
<i>(3.1.2) Matching requirements with capabilities</i>	<i>Negotiating, steering the client, validating early</i>
<i>(3.1.3) Providing stimuli</i>	<i>Bouncing ideas, forming the client opinion, changing ideas, presenting alternatives</i>
<i>(3.1.4) Showing references</i>	<i>Visual artifacts as part of the language</i>
<i>(3.1.5) Showing work in progress</i>	<i>Showing the client as much as possible, making clear what you are trying to achieve</i>
<i>(3.1.6) Approval and review</i>	<i>Getting clarity, getting feedback from client, reporting to a client, showing the right things, intruding the process</i>
<b><i>(3.2) Strategies in internally managing creativity-intensive processes</i></b>	-
<i>(3.2.1) Task allocation and team building</i>	<i>Challenge creativity, finding a balance between technical and creative, identification of complementary skill sets, task allocation, trial and error, getting the right team, knowledge induction process, knowledge transfer</i>
<i>(3.2.2) Resource allocation</i>	<i>Artifact reuse, leveraging people, optimize use of resources, over-commit resources, over-loading key resources</i>
<i>(3.2.3) Managing the scope of creativity</i>	<i>Avoid endless exploring, channeling creativity, encouraging creativity, creative buy-in, giving latitude, granting bending rights and responsibilities, providing stimuli to creative people, putting people under time pressure, restricting creativity, setting up creative atmosphere</i>
<i>(3.2.4) Internal reviews</i>	<i>Communicating standards, dailies, friction losses, providing feedback, gathering creativity from the group, reporting back to a supervisor, tech checks, informal reviews</i>
<i>(3.2.5) Internal break down</i>	<i>Final approvals, temporary approvals, could be better approval</i>
<b>(4) Consequences</b>	
<i>(4.1) Mutual understanding of requirements</i>	<i>Determining requirements specifications, having a cohere vision, being on the same page</i>
<i>(4.2) Mitigating operational and creative risk</i>	-
<i>(4.3) Operational process performance</i>	<i>Making good use of resources, exceeding time and budget, getting caught on execution</i>
<i>(4.4) Creative process performance</i>	<i>Blowing the client away, exceeding expectations, individuality, originality</i>

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**Node/concept (categories, subcategories, Open codes properties)**

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*(4.5) Client satisfaction*

*Addressing what the client wants, being in a service industry, blowing the client away, delivering to a client, delivering to the world standard, exceeding expectations, making the client feel comfortable, thinking about the client, working toward's the client's goal,*

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## Appendix B

The following table provides an overview of which categories contribute to what proposition. The following rough distinction can be made. Propositions 1,2, and 3 pertain to the general nature of creativity-intensive processes, propositions 4,5,6, and 7 pertain to strategies in communication with the customer and propositions 8, 9, 10, and 11 pertain to managing creativity-intensive processes internally. The last two groups of propositions thus also explain the role of IT in creativity-intensive processes.

		Proposition											
		1	2	3	4	5	6	7	8	9	10	11	
Core category	Creativity-intensive process (core category)	X	X	X	X	X	X	X	X	X	X	X	X
Contextual factors	Creative product	X	X										
	Artist	X		X									
	Creative supervisor	X		X									
	Client	X		X									
	Organizational resources and IT Context						X	X		X	X	X	
Strategies	Strategies in communication with the client				X	X	X	X					
	Strategies in internally managing creativity-intensive processes								X	X	X	X	
Consequences	Mutual understanding of requirements	X			X	X	X	X					
	Mitigating operational and creative risk			X	X	X	X	X	X				
	Operational process performance								X	X	X	X	
	Creative process performance								X	X	X		
	Client satisfaction		X		X	X	X	X			X		